

REMARKS

Claims 21-23, 26-28, 30-35, 76-78, 81, 82 and 84-89 are currently pending and claim 21 has been amended to better define Applicant's electroconductive ink. Support for amended claim 21 can be found in the specification at page 9, lines 1-6. No new matter has been added. For the reason set forth below, it is submitted that the cited references would not have rendered obvious the claimed subject matter.

The pending claims were rejected as follows:

- (a) Claims 21, 23, 27-28, 30, 33-34 and 76 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhou in view of Haddon;
- (b) Claims 31-32 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhou in view of Haddon and Shibuta;
- (c) Claims 21-23, 26-28, 30-35, 76-78, 81-82 and 84-89 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Shibuta in view of Zhou.

Applicants respectfully traverse these rejections.

Applicants hereby submit the Declaration of Howard Tennent, Ph.D. ("Tennent Declaration") in support of the patentability of Applicants' claimed subject matter.

As an initial matter, Applicants have amended claim 21 to better define the invention by reciting the property of the electroconductive ink formed in accordance with Applicants' process. That is, the electroconductive ink prepared by Applicants' process would have a viscosity from about 1 to about 50,000 cps and a thixotropic index value from about 1 to about 10.

As p. 3 of the Office Action admits, Zhou (col. 4, lines 25-52, etc.) teaches the following steps in the following order:

- (a) adding carbon nanotubes to a solvent,

- (b) dispersing said carbon nanotubes in said solvent
- (c) filtering said nanotubes from said solvent, then
- (d) optionally milling said nanotubes.

On the other hands, Applicants' independent claim 21 recites:

- (a) adding carbon nanotubes to solution,
- (b) milling said carbon nanotubes in said solution, then
- (c) filtering said solution to form an electroconductive ink having a viscosity from about 1 to about 50,000 cps and a thixotropic index value from about 1.0 to about 10.

Thus, Zhou differ from Applicants' process in at least three respects:

First, in Zhou's process, the milling step (if optionally employed) occurs after the filtering step while in Applicants' process, the milling step occurs before the filtering step.

Second, Zhou optionally mills the filtered carbon nanotubes itself, not carbon nanotubes while they are in the solvent. (col. 4, lines 42-51; Fig 2). On the other hand, Applicants' process mills carbon nanotubes while in solution.

Third, as the amendment better recites, these two process differences result in different products. Specifically, Zhou's product is not an electroconductive ink, but rather a material which must be solution-deposited onto the substrate in order to create an electroconductive coating. (col. 4, lines 42-col. 5, line 7). On the other hand, Applicants' process produces electroconductive inks which can be applied to a

substrate in a number of other ways, such as screen printed, sprayed, brushed, dipped, etc to form an electroconductive coating. (abstract, p. 10, lines 18-19).

Accordingly, Zhou does not disclose, teach or even suggest all of the claimed limitations and does not render obvious the claimed subject matter. *Tennent Declaration*, ¶¶ 9-14.

On the other hand, neither Haddon nor Shibuta makes up for Zhou's deficiencies. In other words, the combinations of (a) Zhou with Haddon, (b) Zhou with Haddon and Shibuta and (c) Shibuta with Zhou still fail to teach all of the claimed limitations. *Tennent Declaration*, ¶ 15.

The Office Action at p. 5 argues that the composition formed by Zhou are the same or substantially the same as the Applicants. That is incorrect. As explained above, Zhou's composition is not an electroconductive ink, but a substance that must be solution-deposited onto a substrate. Zhou's composition cannot be screen printed, sprayed, brushed or dipped onto a substrate. This is because Zhou's composition does not have both a viscosity from about 1 to about 50,000 cps and a thixotropic index value from about 1.0 to about 10 as recited in Applicant's amended claim 21. This difference in property is caused by the two crucial process differences described above between Zhou and Applicant's processes. *Tennent Declaration*, ¶¶ 12-13.

Furthermore, the Office Action's expectation at p. 5 that Zhou's substance be the same as Applicants' electroconductive ink confirms that Applicants' different electroconductive ink is indeed an unexpected result. *Tennent Declaration*, ¶ 13. And thus, withdrawal of these rejections are respectfully requested.

It is noted that the Office Action argues that Zhou teaches dipping at col. 4, lines 55-56 and 66. That is incorrect. Zhou clearly teaches that his substance must be solution-deposited onto a substrate. *Id.*

Thus, for the reasons set forth above, one of ordinary skill in the art would not consider Applicants' process steps prima facie obvious over the teachings of Zhou alone or in combination with Haddon and Shibuta. *Tennent Declaration*, ¶ 16.

As such, Applicants respectfully submit that the subject matter of pending claims 21-23, 26-28, 30-35, 76-78, 81, 82 and 84-89 is allowable over the combinations of the cited references and a notice to that effect is respectfully requested.

No fees are believed due in connection with this filing. However, if any additional fees are necessary, the Director is hereby authorized to charge such fees to Deposit Account No. 50-0540.

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Respectfully submitted,

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